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EC MICROBIOLOGY
Research Article

Immunization Side Effects: Systematic Literature Review

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Received: December 09, 2019; **Published:** December 31, 2019

Abstract

This review is aiming to discuss the immunization side effects, the presented review was conducted by searching in Medline, Embase, Web of Science, Science Direct, BMJ journal and Google Scholar for, researches, review articles and reports, published over the past years. were searched up to November 2018 for published and unpublished studies and without language restrictions, if several studies had similar findings, we randomly selected one or two to avoid repetitive results. On the basis of findings and results this review found mortality, tissue damage, autoantibodies, or parasite recovery, mild generalized systemic reactions (pruritis, hives and rash), malaise, dizziness, slight respiratory distress, tachycardia and headaches, Pain at the injection site, swelling and itching, Reduced appetite, furunculosis epizootic seizures, pyrexia, malaise/fatigue, nervous/musculoskeletal symptoms, rash, edema, induration/ecchymoses, lymphadenopathy, thrombocytopenia, aseptic meningitis, and joint pain

Keywords: *Immunization; Side Effect*

Introduction

Immunization is one of the medical advances that change the process the natural disease courses and how we can protect our self from the disease throughout our life, it helps us to eradicate the smallpox, eliminate poliomyelitis in the Western hemisphere, despite the ability of the immunization to reduce or prevent the occurrence of vaccine-preventable diseases [1,2]. In the recent decade the safety of the vaccination is been questioned since it can cause minor to vary rare serious side effect which is brought the public attention and awareness about it. However, the risk of the getting the disease and its complication still out weight the side effect that might happen from the

vaccination. In this concerns the "National Childhood Vaccine Injury Act of 1986 established a no-fault compensation process for persons possibly injured by selected vaccines" [3].

Immunization found since along time ago but the idea of improving started after pasteur developed the first rabies vaccine in 1885, numerous attempts have been made to improve the antigenicity and safety. The vaccine invented by Pasteur, made from the desiccated spinal cords of rabies-infected adult rabbits, was of limited antigenicity and reactor- genicity [4]. In the 1950s, vaccines made from the brains of suckling mice decreased side effects but antigenicity remained unsatisfactory. Duck embryo vaccine, used in the US from 1958-1981, was of limited antigenicity [5,6]. The adaption of rabies virus to human diploid cell culture resulted in a dramatic improvement in the immunogenicity and safety of rabies vaccines had succeeded during the two last decade [7,8]. The production of Diploid cell is long and difficult, however, with limited yield of rabies virus from these cells. Human diploid cell rabies vaccine (HDCV) production costs are therefore extremely high, especially compared with those of neural tissues vaccines that remain the most frequently used product in most developing countries [9]. In addition, ~ 5% of persons who receive the HDCV as an initial pre-exposure immunization series and then receive a booster of HDCV [10], regardless of whether intramuscular (I.M) or intradermal (I.D), develop a typical type 3 hypersensitivity reaction [11,12].

When HDCV was first licensed, the Immunization Practices Advisory Committee (ACIP) recommended that persons with continuing risk receive a pre-exposure booster every 2 years [13]. Unfortunately, ~6% (range 0 - 21%) of persons receiving pre-exposure boosters have developed systemic allergic reactions characterized by a pruritic or urticarial rash and sometimes by angioedema, fever, malaise, arthralgia, arthritis, nausea and vomiting [14,15]. These symptoms are similar to those of IgE-mediated delayed hypersensitivity and the reactions have been associated with IgE antibodies directed against fl-propiolactone-treated human serum albumin [16,17] a substance present in the only HDCV currently licensed in the US and in the one previously licensed in the US [16]. Unfortunately, human serum albumin and fl- propiolactone are both currently necessary in the manufacture of HDCV. The human serum albumin necessary to maintain the virus-infected diploid cells; fl-propiolactone inactivates the rabies virus while preserving the antigenicity of the preparation. To decrease the number of persons who develop a systemic allergic reaction, the ACIP recommended that not all persons who receive rabies pre-exposure prophylaxis also receive routine boosters [18].

We conducted this reviews to find out the side effects of immunization, and to have more insight about it.

Methods

The current review was conducted in November 2019 based on the preferred reporting clauses for systematic reviews and the PRISMA criteria for systematic reviews. we showed all the topics on the side effects of immunizations, such as mortality, tissue damage, autoantibodies, or parasite recovery, mild generalized systemic reactions (pruritis, hives and rash), malaise, dizziness, slight respiratory distress, tachycardia and headaches, Pain at the injection site, swelling and itching, Reduced appetite, furunculosis epizootic. To achieve this goal, we searched Medline, Embase, Web of Science, Science Direct, and Google Scholar for, researches, review articles and reports, published over the past 15 years.

Our search was completed without language restrictions. Then we extracted data on study year, study design, and key outcome on diabetes. The selected studies were summarized and unreproducible studies were excluded. Selected data is shown in the table 1.

Inclusion criteria

Inclusion criteria were immunization side effects with children, adult.

Exclusion criteria

Irrelevant articles [not related to the aim of this review and articles that did not meet the inclusion criteria in this review.

Author and year	Sample	Side effect	Key point
Miguel AB, 1981 [19]	470 mice	Mortality, tissue damage, autoantibodies, or parasite recovery.	Immunoprotectionis not necessarily associated with immunopathology.
David W, 1988 [20]	78 subjects (35 males and 43 females, aged 21 to 37	Mild generalized systemic reactions (pruritis, hives and rash), malaise, dizziness, slight respiratory distress, tachycardia and headaches	No adverse reactions were noted following the 2year booster with PCEC. The PCEC can be produced at less than one-half the cost of the HDCV.
Daniel B, 1688 [21]	Were 99 veterinary students and employees at the New York State College of Veterinary Medicine at Cornell University	Pain at the injection site, swelling and itching	There were no significant differences in the frequency of local or systemic reactions when the two vaccines were compared, controlling for route of immunization.
P. J. Midtlyng, 1995 [22]	Approximately 4600 Atlantic salmon S1	Reduced appetite, furunculosis epizootic, mortality	Only use of mineral oil adjuvanted vaccines induced durable protective immunity against virulent waterborne furunculosis challenge.
Robert L, 1997 [23]	18036	Seizures, pyrexia, malaise/fatigue, nervous/musculoskeletal symptoms, rash, edema, induration/ecchymoses, lymphadenopathy, thrombocytopenia, aseptic meningitis, and joint pain	The risk for clinical events after MMR2 immunizations is greater in the 10- to 12-year age group.
Kristin L, 1996 [24]	849 subjects	Fever, myalgias, fatigue, malaise, or headaches	Influenza vaccination of healthy working adults is not associated with higher rates of systemic symptoms when compared with placebo injection

Table 1: *Results from sequencing studies.*

Data extraction and analysis

Information relating to each of the systematic review question elements was extracted from the studies and collated in qualitative tables. Direct analysis of the studies of immunization side effects.

Results and Discussion

The vaccinations of 107 organisms is harmless and it has been tested in new born mice. Also, there is no lethality in parasites because it has been observed for more than 406 rats [19]. On day 0 there were no antibodies has been detected on the volunteers [20]. Studies had shown that 11 out of 77 people had exceeded the acceptable minimum and after 26 months from the start of the initial immunization chain they were identified [21].

In the first 24 hours after vaccination three of the fish died and 16 fish in the next 36 days, as observed loss of appetite in all groups for 3 weeks [22]. Children aged 10 - 12 are more likely to have a clinical event after vaccination than children aged 4 - 6 years [23]. There's no difference between the two groups in systemic symptoms [24].

The vaccinations is improved throughout the years and most potential risks of using live vaccines against infection have been assessed. Parasites have been recovered from all breeds 2, 14, 16 of fortified cattle And prove the recovery of the organism from the vaccinated individuals 4, 5, 9, 10 [19]. The study dedicated only one case of tuberculosis after previous vaccinations and there are key factors for this condition of Lack of enhanced post-exposure immunizations, malaria prevention, vaccine disease 1 second [20].

Volunteers that have been vaccinated with HDCV traditional are less likely to react systemically [21]. The long protective immunity is given from mineral oil vaccine ,great protection and high antibodies have been found in salmon, and *Salmonella* vaccination has also been found to protect against thyroid tumor [22]. The older children have more serious illness than younger children as the study shows [23]. Arm pain is the most common symptoms among all the individuals that have received the vaccine [24].

Conclusion

The results of this studies show the immunization side effects. On the basis of findings and results this review found mortality, tissue damage, autoantibodies, or parasite recovery, mild generalized systemic reactions (pruritis, hives and rash), malaise, dizziness, slight respiratory distress, tachycardia and headaches, Pain at the injection site, swelling and itching, Reduced appetite, furunculosis epizooticare, seizures, pyrexia, malaise/fatigue, nervous/musculoskeletal symptoms, rash, edema, induration/ecchymoses, lymphadenopathy, thrombocytopenia, aseptic meningitis, and joint pain the most common immunization side effects.

Conflict of Interest

The authors of this article hasn't receive and support for this work and it was completely self-funded.

Bibliography

1. World Health Organization. "The global eradication of smallpox: final report of the Global Commission for the Certification of Smallpox Eradication". In: History of international public health. No. 4. Geneva, Switzerland: World Health Organization (1980).
2. CDC. "Certification of poliomyelitis eradication-the Americas, 1994". *Morbidity and Mortality Weekly Report* 43 (1994): 720-722.
3. The National Childhood Vaccine Injury Act of 1986, § 2125 of the Public Health Service Act as codified at 42 U.S.C. 300aa (1987).
4. Baltazard M and Bahmanyar M. "Essai pratique du serum antrabique chez les mordus par Ioups enrages". *Bulletin of the World Health Organization* 13 (1955): 747-772.
5. Corey L., *et al*. "Serum neutralizing antibody after rabies post-exposure prophylaxis". *Annals of Internal Medicine* 85 (1967): 170-176.
6. Tierkel ES and Sikes RK. "Preexposure prophylaxis against rabies: comparison of regimens". *Journal of the American Medical Association* 201 (1967): 911-914.
7. Bahmanyar M., *et al*. "Successful protection of humans exposed to rabies infection". *Journal of the American Medical Association* 236 (1976): 2751-2754.
8. Dreesen DW., *et al*. "Intradermal use of human diploid cell vaccine for pre-exposure rabies immunizations". *Journal of the American Veterinary Medical Association* 181 (1982): 1519-1523.
9. Nicholson KG and Turner GS. "Studies with human diploid cell strain rabies vaccine and human antirabies immunoglobulin in man". *Developments in Biological Standardization* 40 (1978): 115-120.
10. Centers for Disease Control. "Rabies prevention United States, 1984". *Morbidity and Mortality Weekly Report* 33 (1984): 393-402.

11. Centers for Disease Control. "Systemic allergic reactions following immunization with human diploid cell rabies vaccine". *Morbidity and Mortality Weekly Report* 33 (1984): 185-187.

12. Dreesen DW., *et al*. "Immune complex-like disease in 23 persons following a booster dose of rabies human diploid cell vaccine". *Vaccine* 4 (1986): 45-49.

13. "Immunization Practices Advisory Committee Rabies prevention". *Morbidity and Mortality Weekly Report* 33 (1980): 265-272.

14. Centers for Disease Control. "Systemic allergic reactions following immunization with human diploid cell rabies vaccine". *Morbidity and Mortality Weekly Report* 33 (1984): 185-187.

15. Dreesen DW., *et al*. "Immune complex-like disease in 23 persons following a booster dose of rabies human diploid cell vaccine". *Vaccine* 4 (1986): 4549.

16. Anderson MC., *et al*. "The role of specific IgE and beta-propiolactone in reactions resulting from booster doses of human diploid cell rabies vaccine". *Journal of Allergy and Clinical Immunology* 80 (1987): 816-818.

17. Warrington RJ., *et al*. "Immunologic studies in subjects with a serum sickness-like illness after immunization with human diploid cell rabies vaccine". *Journal of Allergy and Clinical Immunology* 79 (1987): 605.

18. "Immunization Practices Advisory Committee Rabies prevention - United States, 1984". *Morbidity and Mortality Weekly Report* 33 (1984): 393-402, 407-408.

19. Miguel B., *et al*. "Side Effects of Immunization with Live Attenuated Trypanosoma cruzi in Mice and Rabbits". *Infection and Immunity (USA)* 36.1 (1982): 342-350.

20. David W., *et al*. "Two-year comparative trial on the immunogenicity and adverse effects of purified chick embryo cell rabies vaccine for pre-exposure immunization". *Vaccine* (1988).

21. Daniel B., *et al*. "Human diploid cell rabies vaccine purified by zonal centrifugation: a controlled study of antibody response and side effects following primary and booster pre-exposure immunizations". *Vaccine* (1988).

22. Midtlyng PJ., *et al*. "Experimental studies on the efficacy and side-effects of intraperitoneal vaccination of Atlantic salmon (Salmo salar L.) against furunculosis". *Fish and Shellfish Immunology* (1995).

23. Robert L., *et al*. "MMR2 Immunization at 4 to 5 Years and 10 to 12 Years of Age: A Comparison of Adverse Clinical Events After Immunization in the Vaccine Safety Datalink Project". *Pediatrics* 100.5 (1997): 767-771.

24. Kristin L., *et al*. "Side Effects Associated With Influenza Vaccination in Healthy Working Adults A Randomized, Placebo-Controlled Trial". *Archives of Internal Medicine* 156.14 (1996): 1546-1550.

Volume 16 Issue 1 January 2020